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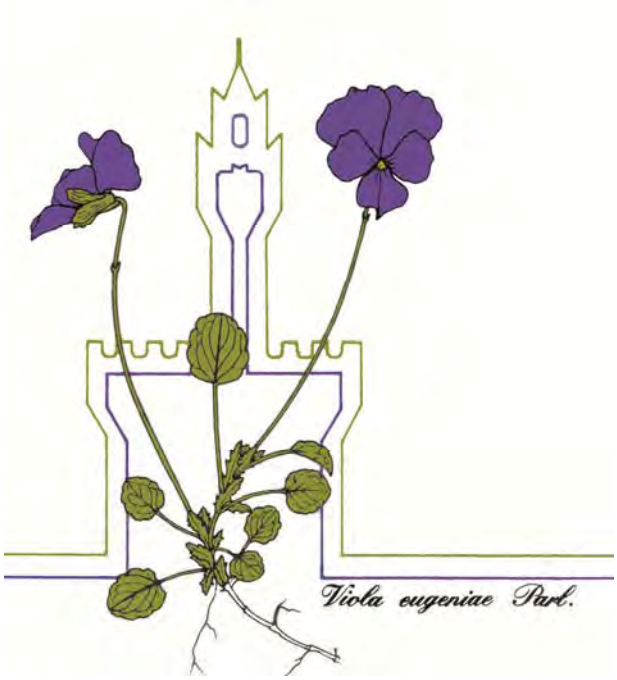

ABSTRACTS

KEYNOTE LECTURES, COMMUNICATIONS, POSTERS

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COMMUNICATIONS

PLANT TRAITS 2.0 IN ITALY: BACK TO THE FUTURE

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Plant Functional Traits (PFTs) are defined as any morphological, anatomical, biochemical, physiological or phenological heritable feature measurable at the individual level, from the cell to the whole-organism level that impact fitness (1, 2). PFTs mediate the response of plants to environment (3), affect the trophic levels and influence ecosystem processes and services (4). Accordingly they are used in many studies ranging from comparative plant ecology to community and functional ecology, from evolutionary biology to biogeochemistry. After face-to-face networking during the workshop "Plant traits 2.0" (SBI, February 9-10, 2017, Bologna), we decided to review the main findings of the Italian studies related to PFTs of vascular plants, lichens and bryophytes. We were able to collect 106 papers published in national and international peer-reviewed journals until May 2017. Review articles are usually an important source of information where scientific findings, methods, gaps and perspectives are gathered and summarized. Italy represents a highly interesting model region, since it covers a remarkable latitudinal and climatic gradient spanning three biogeographic regions (Alpine, Continental, Mediterranean), which shelter a broad variety of habitats from close-to-natural, to managed semi-natural and agro-ecosystems, and host a high plant species richness.
Almost the entire scientific production was performed during the past decade and studies were mainly carried out in the Continental biogeographic region (40%), followed by the Alpine (34%) and the Mediterranean region (26%). Secondary grasslands (35%) and forests (23%) resulted the most studied ecosystems, while few studies have dealt with Mediterranean shrublands and silvopastoral systems (3.5%), coastal habitats (8%) and montane primary grasslands or shrublands (9%). A similar frequency in the use of whole plant (25%), leaf (20%) and seed traits (18%) was observed. These broad groups encompass traits inherent to major ecological strategy theories, such as the three key traits related to the Leaf-Height-Seed plant ecology strategy scheme (5): specific leaf area, plant height and seed mass. Additionally, leaf traits (i.e. leaf area, specific leaf area, leaf dry matter content (6)) are used to classify plants according to the CSR strategy scheme (7). Phenological and clonal traits were also well represented (respectively 16% and 12%), while few papers dealing with root traits were evident (2%). Plant traits were primarily measured from samples collected in the field. The variation of these plant functional traits has been studied mainly along environmental gradients (79%) and climate manipulation experiments (11%). Among environmental gradients, climate and elevation were the most investigated, followed by land-use/management and soil nutrient/moisture. This first survey of Italian papers dealing with plant functional traits demonstrates a surprisingly high scientific production. Accordingly, we propose the enhancement of collaboration among research groups, focusing on a few recommendations for future research in Italy:
a) increase the research activity in the Mediterranean biogeographic region, with particular regard to Mediterranean shrublands, silvopastoral systems and coastal areas;
b) extensively investigate belowground traits (i.e. root and clonal traits), since these are informative with regard to fundamental mechanisms, including plant-plant, plant-soil and plant-climate interactions;
c) further investigate the effect of climate change on plant functional traits, at species and also community levels. In this regard, experimental approaches in the field or in controlled environments could be useful to disentangle the effect of land-use change in managed semi-natural ecosystems and agro-ecosystems.

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